



Building Columbia

From the System Administrator
View

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Overview

- About NASA Advanced Supercomputing (NAS) Division
 - Who we are
- Columbia Configuration
 - Software Configuration
 - Hardware Configuration
 - Network Configuration
- Building Columbia
 - How we did it
- Future Plans





About NASA Advanced Supercomputing Division

- Our Mission

- To lead the country in the research, development, and delivery of revolutionary, high-end computing services and technologies to facilitate NASA Mission success

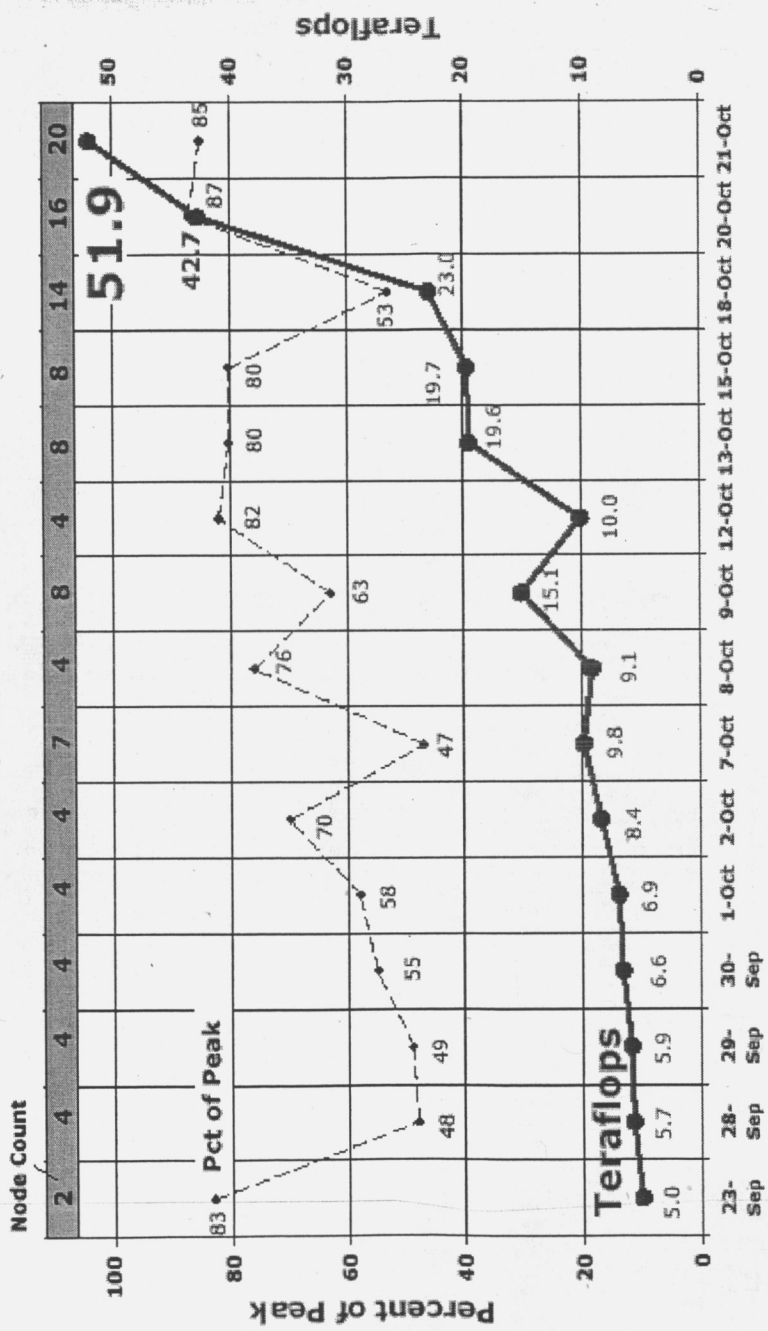




LinPack



Columbia Linpack Results

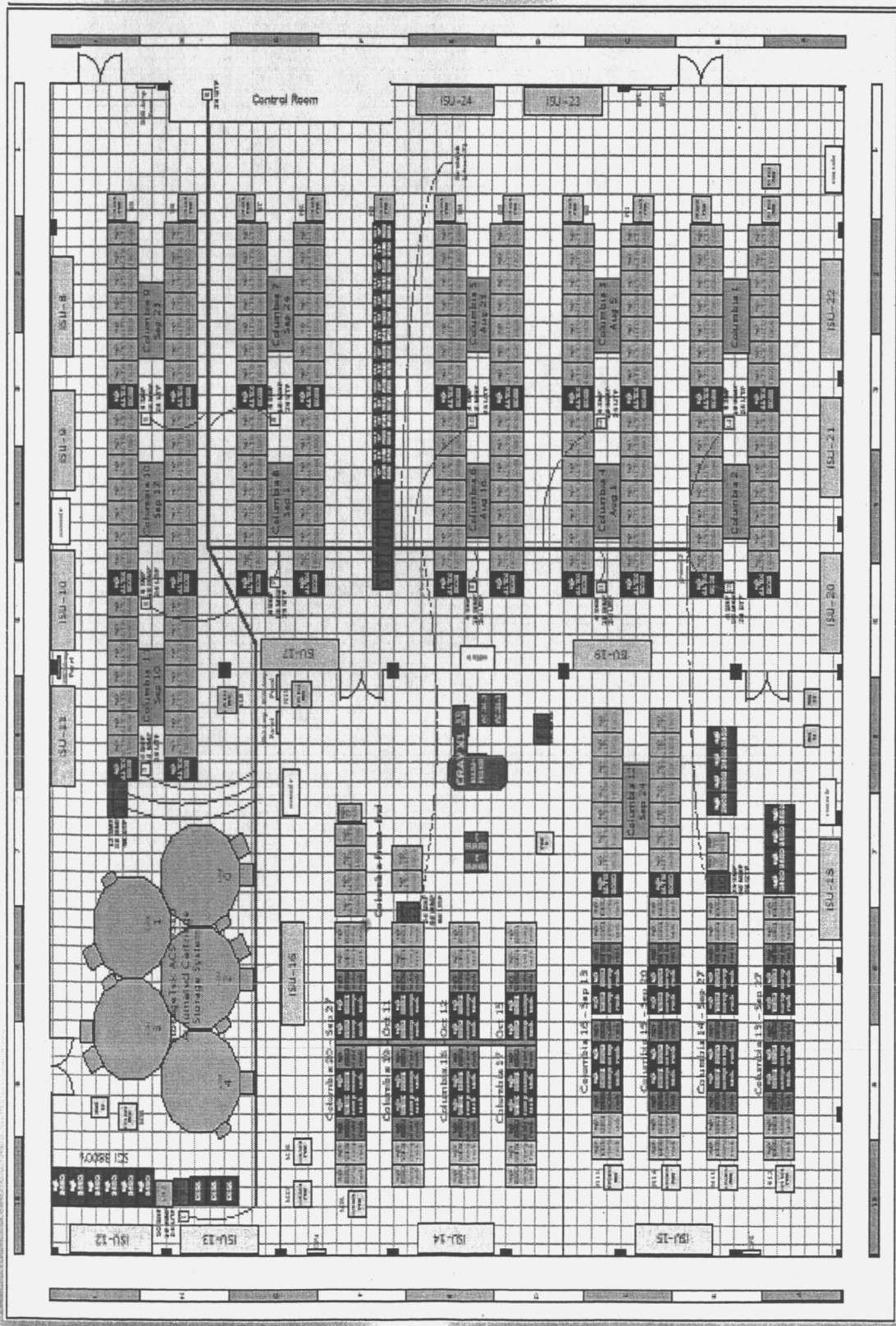




Computer Floor Diagram



Ames Research Center



NAS
NASA ADVANCED SUPERCOMPUTING

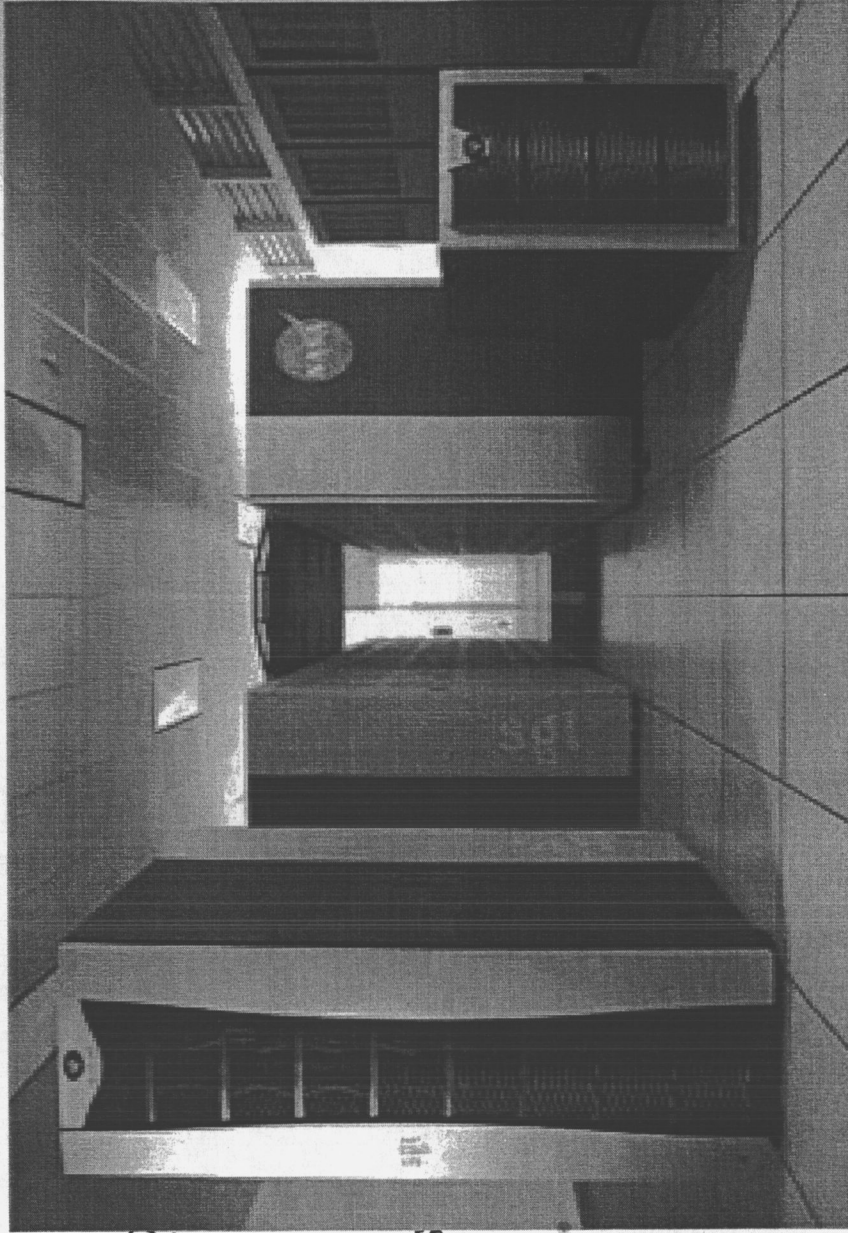


Columbia Configuration

Why 512

Processor nodes?

- Experience with Kalpana
- Fast, easy access to a large amount of memory
- Easier to administrate fewer fat nodes





Hardware Configuration

- 12 SGI Altix 3700
 - 1.5 Ghz Itanium 2 6MB L2 cache
 - 1 TB of memory
- 5 SGI Altix 3700 BX2
 - 1.6 Ghz Itanium 2 9MB L2 cache
 - 1 TB of memory
- 3 SGI Altix 3700 BX2
 - 1.5 Ghz Itanium 2 6MB L2 cache
 - 1 TB of memory





Columbia Storage

- 440 TB of storage
 - 6 SATA TP9500
 - 9 FC TP9500
- 2 128 port Brocade switches
 - Redundant 2 Gb connections
- 2 TB home filesystems NFS exported from IRIX Failsafe servers





Software Configuration

- Propack 3
 - Currently running Propack 3 SP 4
 - Evaluating Propack 4 on a test machine
- PBSPPro
 - Locally modified PBSPPro 5.3.2





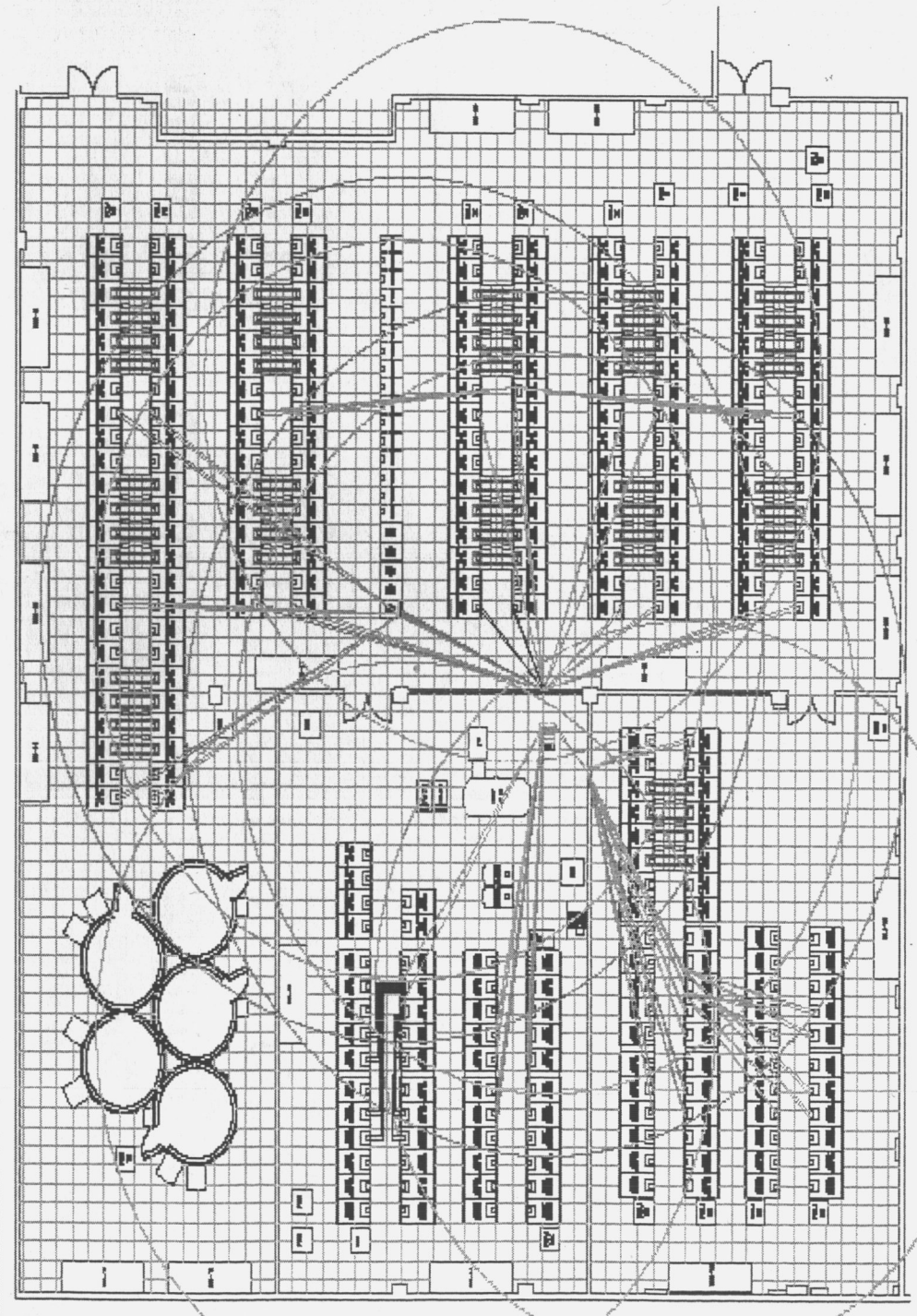
Network Configuration

- Gigabit Ethernet
 - All of the columbia machines use gigabit ethernet with jumbo frames as their primary interface
- 10 Gigabit Ethernet
- IB/NFS private Gigabit Ethernet
- IB network





Infiniband Cable Diagram





Building Columbia

- Tight schedule
 - 4 months to build Columbia for SC05
 - Little room for unexpected issues
- Maintain production while building Columbia
 - Continue production work while reworking the facilities to accommodate Columbia



Delivery Schedule



SGI Shipment	Arrival Date	Production Date	SGI Model
0	2003	2003	Altix 3700
1	July		Altix 3700
2	July		Altix 3700
3	Aug 5		Altix 3700
4	Aug 16		Altix 3700
5	Aug 23		Altix 3700
6	Sep 1		Altix 3700
7	Sep 10		Altix 3700
8	Sep 13		Altix 3700 BX2
9	Sep 17		Altix 3700
10	Sep 20		Altix 3700 BX2
11	Sep 23		Altix 3700
12	Sep 24		Altix 3700
13	Sep 24		Altix 3700
14	Sep 27		Altix 3700 BX2
15	Sep 27		Altix 3700 BX2
16	Sep 27		Altix 3700 BX2
17	Sep 27		Altix 3700 BX2
18	Oct 12		Altix 3700 BX2
19	Oct 12		Altix 3700 BX2





Configuring Columbia

- Configure everything early
 - Bound LUNs ahead of time
 - Get all licenses early
 - Clone system disks and configure for incoming system before it arrives
 - Have power and network cables ready





Future Plans

- Begin using System Imager to maintain the nodes and keep them in sync
- Begin transition from ProPack 3 to ProPack 4
- 2048 SSI?





Questions?

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